Appendix O

Parking Technical Report

Parking Technical Report

Prepared for:

City of Seattle Strategic Planning Office

as part of

Downtown Height & Density
Environmental Impact Statement

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I. AFFECTED ENVIRONMENT

This parking analysis reviews existing parking supply and demand information for a portion of the Downtown Urban Center, and assesses the probable parking impacts of future growth scenarios represented by four EIS alternatives. The level of detail provided in the analysis is intended to be consistent with the programmatic, non-project nature of the proposal and the environmental impact statement.

Data sources include parking inventory and utilization data compiled by the Puget Sound Regional Council (PSRC) and the City of Seattle's Comprehensive Neighborhood Parking Study, and information about mode shares and transportation demand management from King County and the Washington State Department of Transportation.

The study area for this analysis includes the portion of Downtown Seattle bordered by Denny Way on the north, I-5 on the east, Yesler Way on the south and Alaskan Way on the west, omitting Pioneer Square and the International District. This study generally characterizes the area south of Olive Way as part of the commercial core neighborhood, and areas north of Olive Way (and Stewart Street west of 3rd Avenue) as the Denny Triangle and Belltown neighborhoods.

A. Parking Supply and Utilization

Off-Street Parking Supply

The 1999 PSRC *Parking Inventory for Seattle and Bellevue* and supplemental data from the City of Seattle are the source for off-street parking supply information. There are roughly 48,000 off-street parking spaces in approximately 540 lots and garages within the Downtown study area. The types of spaces are as follows:

38,000 spaces, general public paid parking
5,600 spaces, employee parking
3,200 spaces, residential parking
1,000 spaces, customer/short-term free parking

Approximately 19,220 parking spaces, about 40 percent of the total inventory, are located north of Olive Way, while approximately 28,000 parking spaces (60 percent of the total) are located south of Olive Way. An additional 700 parking spaces are located in unspecified newer developments throughout the study area. The data indicate that parking facilities in the commercial core area south of Olive Way tend to be larger than facilities north of Olive Way. However, there are a greater number of off-street facilities (likely smaller surface parking lots) in areas north of Olive Way. Figure 1 illustrates the location of off-street parking garages and lots.

Off-Street Parking Utilization

Average weekday utilization of off-street parking is available from 1999 PSRC data for the study area as a whole, and for areas north and south of Olive Way (see Table 1). Average weekday morning parking utilization for the entire study area is approximately 81 percent, and average afternoon parking utilization is approximately 77 percent. The subarea data indicate that off-street parking in areas south of Olive Way is slightly more occupied on average than areas north of Olive Way. This is generally consistent with the greater employment density and commercial activity in the commercial core area. These parking utilization rates indicate that a modest amount of off-street parking capacity is available on an average day, if the user is willing to pay. Parking rates are generally highest in the central part of the commercial core, easing gradually with greater distance to the north and south.

Table 1
Average Weekday Off-Street Parking Utilization

		Average Weekday Utilization			
	Max. Capacity (see note)	Morning (9-11:30 am)		Afternoon (1-3:30 pm)	
Total Study Area	47,230	38,380	*81%*	36,450	*77%*
N/of Stewart/Olive	19,220	15,090	*79%*	14,545	*76%*
S/of Stewart/Olive	28,010	23,290	*83%*	21,905	*78%*

Source: PSRC data compiled by Parsons Brinckerhoff.
Note: The maximum capacity for the total study area (47,230) does not include 700 parking spaces at new developments. Utilization data was not available for parking at these new developments.

Historical Trend in Parking Utilization, Supply, and Price

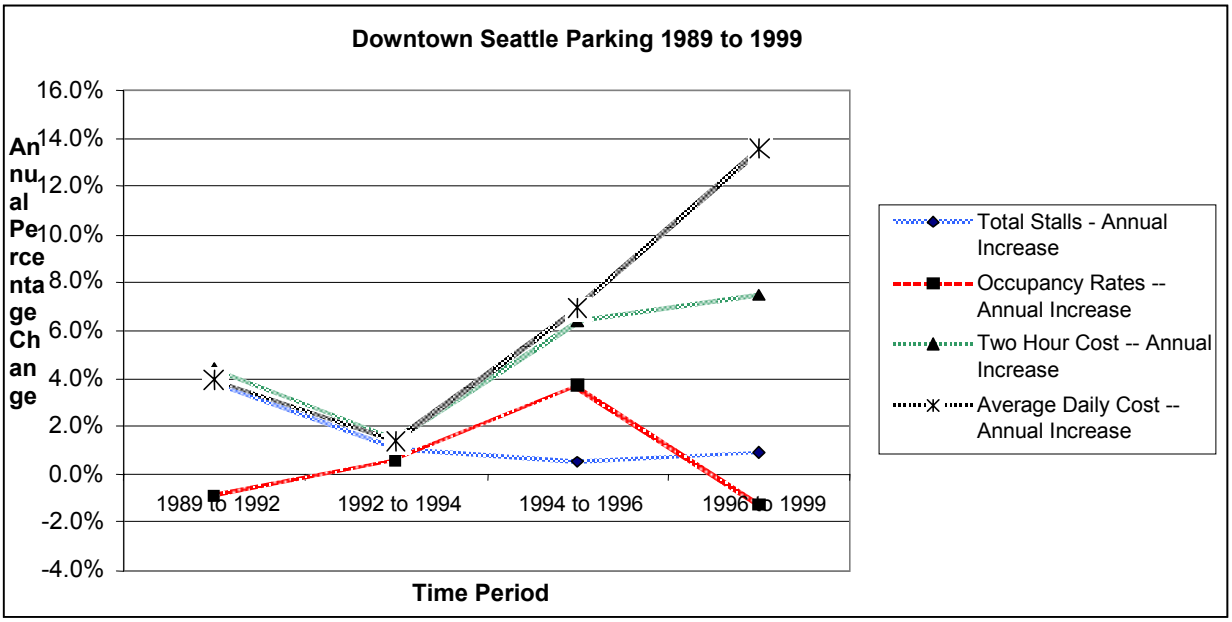
The Puget Sound Regional Council inventoried off-street parking in Downtown Seattle in 1989, 1992, 1994, 1996, and 1999. This inventory included a count of total parking stalls, occupancy, and cost. Table 2 below summarizes the parking information for Downtown Seattle.

The relationships between parking supply, demand (represented as occupancy), and cost are complex. As shown in Table 2, from 1989 to 1999, the cost of parking increased faster than the demand or supply of parking changed. As shown in Table 2, between 1989 and 1999, parking supply increased by an annual average of 1.8%. During this same time period, the average daily cost increased by an annual average of 6.8%. The demand, expressed as occupancy, has at times increased, and at other times decreased. It decreased between 1989 and 1992, possibly because of an increase in parking supply during this same period of more than 5,000 spaces. As shown in Figure 1, occupancy decreased between 1996 and 1999. During this period the cost of daily parking jumped considerably, while the supply of parking increased only modestly. Parking supply increased by only about 900 spaces, but the daily cost of parking increased by about $4.50, or over 13 percent. This suggests that between 1996 and 1999, the demand for parking decreased partially because it became too expensive for some to park.

Table 2
Summary of Parking in Downtown Seattle, 1989–1999

Parking Data	1989	1992	1994	1996	1999	Average Annual % Change
Total Stalls	45,389	50,863	52,596	53,164	54,063	
Total Stalls -- Annual Percent Change	--	3.9%	1.1%	0.5%	0.9%	1.8%
Occupancy Rates	75.4%	73.3%	74.6%	80.3%	78.2%	
Occupancy Rates -- Annual Percent Change	--	-0.9%	0.6%	3.7%	-1.3%	0.4%
Two Hour Cost	$3.76	$4.28	$4.41	$4.99	$6.20	
Two Hour Cost -- Annual Percent Change	--	4.4%	1.5%	6.4%	7.5%	5.1%
Average Daily Cost	$7.45	$8.37	$8.60	$9.83	$14.39	
Average Daily Cost -- Annual Percent Change	--	4.0%	1.4%	6.9%	13.6%	6.8%

Figure 1
Summary of Parking Changes in Downtown Seattle, 1989–1999



Over time, market forces will continue to influence the supply of parking, the demand for it, and the cost. More detailed information about this inventory of parking can be found in *Parking Inventory for Seattle and Bellevue, 1999*, which can be found at PSRC's website (http://www.psrc.org/datapubs/pubs/parking1999.htm).

On-Street Parking Supply

Although much of the Downtown study area's on-street parking supply primarily consists of parallel curb parking controlled by parking meters, the different subareas have different mixes of on-street parking resources, as described below.

Commercial Core (south of Olive Way)

Office core and retail core vicinity

Metered parallel parking typically present on east-west streets, but more limited on portions of the north-south avenues such as 4th, 5th and 1st Avenues. Typical metering is two hours, with some meters thirty minutes or less.
Commercial vehicle parking zones and pickup/dropoff zones
Selected areas reserved for government vehicles near public facilities
Limited carpool parking on some blocks, primarily in peripheral areas
Curb parking frequently interrupted by bus stop zones and curb cuts

Western Avenue vicinity

Metered parallel parking in a majority of locations, two-hour and short-term
Metered angle parking in adjacent Alaskan Way corridor
Commercial vehicle parking zones and pickup/dropoff zones

Belltown

Metered parallel parking in majority of area, majority with two-hour term

Denny Triangle (north of Olive Way)

Metered parallel parking in majority of area, majority with two-hour term
Relatively limited number of streets with no curb parking
Limited carpool parking on a few blocks, primarily in northern area
Angled parking available in some non-arterial blocks
Free curb parking available
Curb parking occasionally interrupted by bus stop zones and curb cuts
Bus layover zones defined in a few blocks

Nearby Areas Outside Denny Triangle

South Lake Union vicinity

Other than Denny and Valley most streets offer plenty of parking
Most parking is free parallel parking with a time limit of two hours or no time limit at all.
Metered parking is mainly limited to two hours.
In the Seattle Times area metered parking is limited to fifteen minutes.
In the Denny/Harrison/Westlake area there is a mix of angled parking with parallel with a couple of blocks limiting parking to four hours
Commercial vehicle parking zones and pickup/dropoff zones
Curb parking frequently interrupted by bus stop zones and curb cuts

On-street parking utilization data is available for portions of the Belltown and Denny Triangle neighborhoods, but not the commercial core. Table 3 describes the average weekday and peak hour on-street parking utilization for sampled portions of those neighborhoods, with a comparison to the Pike-Pine neighborhood, adjacent and east of Downtown. The peak hour on-street parking utilization in Belltown is approximately 87 percent, considerably higher than the Denny Triangle's peak hour utilization of approximately 71 percent. The average parking

utilization for both neighborhoods is approximately the same at 61-62 percent.[1] In an everyday operational sense, on-street parking is generally perceived to be near capacity when rates reach 80 to 85 percent. The perception of low parking availability at these rates occurs because, while turnover may be relatively high, the available spaces are dispersed infrequently within the entire street network, making them difficult to find. The somewhat lower rate of utilization for the Denny Triangle may reflect the tendency for lower parking utilization in peripheral locations and greater utilization closer to the retail and commercial core.

As a comparison, the Pike-Pine neighborhood adjacent to Downtown has an average utilization of 84 percent and a peak hour utilization of 91 percent, higher than both of the studied Downtown neighborhoods. This high utilization is likely due to the combination of dense residential use and growing commercial uses in that neighborhood.

Table 3
Existing On-Street Parking Utilization in Selected Neighborhoods

	On-Street	
Sub-Area	**Average Utilization**	**Peak Hour Utilization**
Denny Triangle	*61%*	*71%*
Belltown	*62%*	*87%*
Pike-Pine	*84%*	*91%*
TOTALS		

Source: PSRC and City of Seattle data compiled by Parsons Brinckerhoff.

In addition, a considerable amount of on-street parking is available in the south end of the study area near the baseball and football stadiums. Within a ten-minute walk of the stadiums (about five or six blocks largely in the Pioneer Square and International District areas), about 1,830 on-street parking spaces are available.[2]

[1] These utilization figures are based on a sample of the on-street parking inventory, including 210 spaces in Denny Triangle and 360 spaces in the Belltown neighborhood.
[2] Source: SR 519 Operational Analysis Team - *SR 519 – Operational Analysis Weekday Event*, May 1998.

II. IMPACTS

Table 4 compares parking lost, parking added, and parking demand in 2020 for all alternatives. Demand is estimated for a baseline 2020 condition, as well as a TDM-intensive condition (to estimate how parking demand could be reduced if the new developments instituted strong TDM programs). The five sections of Table 4 are explained as follows:

1. Existing Parking – Identifies total off-street existing parking in the study area by type of parking: customer parking, employee parking, or "other" parking. Note that "other" parking is generally public pay parking. This includes public pay parking in stand-alone parking garages and lots, as well as paid public parking in office buildings.

2. Parking Lost Due to Development – The new development will displace some existing off-street parking. Parking lost is broken into two categories: spaces lost from stand-alone public parking lots and garages, and other spaces lost (primarily parking included as part of an office building or other development). Parking spaces lost from stand-alone public parking lots and garages is important to note because these are parking spaces available to the entire Downtown area, not just building tenants. The second category "other spaces lost" is less important to note since it is assumed that the new developments will provide their own parking. For example, the new development may replace an existing office building that provides its own parking. Because the new development will also provide its own parking, the parking is not really lost, just replaced.

3. Parking Spaces Added According to Current Code – This section of the table documents the minimum parking spaces provided according to code, which is based primarily on the square footage. Table 4 assumes .67 parking spaces provided per 1,000 square feet of gross floor area (including .13 carpool spaces). For hotels the assumption is 1 space per 4 rooms. These numbers represent minimums, and developers may instead choose to provide parking levels higher than these minimums if market conditions warrant it. For residential units, there are no parking requirements. However, Table 4 assumes .63 parking spaces per residential unit (based on 1990 census data on auto ownership in Downtown Seattle). This may underestimate parking provided since developers may instead provide 1 parking space per residential unit. In downtown areas it is normal for the parking provided to be less than unrestricted demand. This is one of the reasons why parking is usually expensive in downtown areas. The excess demand then either parks in adjacent areas or uses alternative modes of transportation.

4. 2020 Parking Demand Based On Number of Employees and Residential Units – Predicting parking demand is very complicated, and is impacted by the number of employees, parking cost, availability, and availability of alternative modes of transportation. A very simple method for estimating 2020 parking demand is included in this section. This method is based on the number of employees and residents, and an assumption of the number of employees who will drive their cars to work. To estimate year 2020 vehicle work trips per employee for the study area, the 2020 Regional Model was utilized. Specifically, mode share information for 2020 home to work (Downtown Seattle) trips was used. The Regional Model indicated .31 vehicle trips per employee, and assumes some TDM (e.g., expensive downtown parking). Mode share assumptions used to derive this number are included in the Appendix. This number was then reduced by 5% to account for a percentage of employees absent on any given day. For residential units, .63 parking spaces per residential unit were assumed based on the most recent (1990) census data available.

5. 2020 Potential Mitigation Impacts of TDM Supportive Measures – For potential mitigation impacts (for a more extensive TDM program in the new developments), mode share from two data sources was compared: data from the *WSDOT CTR Task Force 2001 Report to the Legislature* for Downtown Seattle (for employers impacted by CTR legislation), and King County mode share information for a sample of Flex Pass Customers. The WSDOT CTR Task Force data is presumed to represent mode share for a "standard" TDM program, while the King County data is assumed to represent mode share for a more extensive TDM program. The mode share difference between an "extensive" TDM program and a "standard" TDM program was then applied to the 2020 mode share to estimate potential 2020 mode share assuming TDM mitigation. This method indicated .24 vehicle trips per employee. This number was also then reduced by 5% to account for a percentage of employees absent on any given day.

A. 2020 Baseline Growth Condition (Alternative 4 – No Action)

Future projected growth and redevelopment in the Downtown study area will result in changes to parking supply and demand conditions, with or without any changes to zoning. This discussion addresses conditions in 2020 for Alternative 4 - the No Action Alternative.

Projected future development under EIS growth assumptions is for an additional 70,000 jobs and approximately 17,500 residential households in the Downtown Urban Center through 2020. The EIS growth assumptions predict approximately the same amount of job and residential growth for all alternatives, so there will only be limited differences in parking impacts among the alternatives.

Off-Street Parking

Future residential and employment growth throughout the study area would increase overall demand for parking. Table 4 compares predicted parking supply and demand conditions in 2020 for all of the alternatives. A detailed description of Table 4 is provided at the beginning of the Impacts section of this memorandum. Demand is estimated for a baseline 2020 condition, as well as a TDM-intensive condition (to estimate how parking demand could be reduced if the new developments instituted strong TDM programs). Parking supply estimates in Table 4 assume that minimum parking requirements for commercial uses would be met, and that residential development (which has no minimum parking requirement) would provide .63 parking spaces per residential unit[3].

[3] The value .63 is a low estimate based on 1990 census data for auto ownership per household in downtown Seattle census tracts. In reality, developers may instead provide each unit with a parking space. So this estimate of parking provided may be conservatively low.

Table 4
Parking Lost, Parking Added, and Potential Parking Demand

Existing Parking	
Total Parking in Study Area (Denny to Yesler, West of I-5)	47,226
Percent Other (generally public pay parking - stand alone and in office buildings)	83%
Percent Employee parking	14%
Percent Customer (short-term free)	3%

Parking Lost Due to Development				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Spaces Lost from Stand-Alone Public Parking (Lots/Garages)	3,481	3,481	3,661	3,775
Other Lost Spaces (e.g., Parking Provided In Office Building)	3,656	3,656	3,656	3,774
Total Spaces Lost	7,137	7,137	7,317	7,549

Parking Spaces Added According to Current Code (Plus Assumption for Residential Units)				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Parking Spaces Added (According to Code, Excluding Residential)	12,357	12,178	12,201	12,187
Residential Parking Spaces (assuming .63 space/unit provided by developer)	4,648	4,811	4,696	4,804
Potential Estimated Parking Spaces Added	17,005	16,989	16,897	16,991

2020 Parking Demand Based On Number of Employees and Residential Units:				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Number of Employees/Residential Units				
Jobs	*64,511*	*63,931*	*64,070*	*64,243*
Residential Units	*7,378*	*7,636*	*7,454*	*7,624*
Assumptions Used Regarding Mode Share/Vehicle Work Trips*				
	Vehicle Work Trips/Employee			
Commercial (Office/Retail/Hotel)	0.31			
Residential	0.63	census data - vehicles/household Seattle CBD 1990		
Parking Spaces Required to Meet Demand**				
Parking Spaces for Jobs	*19,113*	*18,942*	*18,983*	*19,034*
Parking Spaces for Residential Units	*4,648*	*4,811*	*4,696*	*4,803*
Total Parking Demand	**23,762**	**23,752**	**23,678**	**23,837**

**Note that some jobs will occur during off peak hours or weekends, so estimate may be high.
However doesn't include visitor or customer parking, which may off-set difference.

2020 Potential Mitigation Impacts of TDM Supportive Measures				
Assumptions Used Regarding Mode Share/Vehicle Work Trips*				
SOV Rates	:le Work Trips/Employee			
Commercial (Office/Retail/Hotel)	0.24			
Residential	0.63	census data - vehicles/household Seattle CBD 1990		
Parking Spaces Required				
Parking Spaces for Jobs	*14,857*	*14,723*	*14,755*	*14,795*
Parking Spaces for Residential Units	*4,648*	*4,811*	*4,696*	*4,803*
Total Parking Demand	**19,505**	**19,534**	**19,451**	**19,598**

*To estimate year 2020 vehicle work trips/employee for the study area, utilized 2020 Regional Model mode share information for 2020 Home to Work (downtown Seattle CBD) trips. The 2020 number assumes some TDM (e.g., expensive downtown parking). This number was then reduced by 5% to account for a percentage of employees absent on any given day.

For potential mitigation impacts (for extensive TDM program), mode share from two data sources was compared: WSDOT CTR Task Force 2001 Report to the Legislature for downtown Seattle (for employers impacted by CTR legislation), and King County mode share information for a sample of Flex Pass Customers. The WSDOT CTR Task Force data is presumed to represent mode share for a "standard" TDM program, while the King County data is assumed to represent mode share for a more extensive TDM program. The mode share difference between an "extensive" TDM program and a "standard" TDM program was then applied to the 2020 mode share to estimate potential 2020 mode share assuming TDM mitigation. This number was also then reduced by 5% to account for a percentage of employees absent on any given day.

As shown in Table 4 under the section "Parking Spaces Added According to Current Code", the predicted amount of off-street parking supply provided with future development would be approximately 16,991 spaces. This includes about 12,200 office/retail parking spaces and about 4,800 residential spaces. Note that these estimates are conservative and developers may very well provide several thousand additional parking spaces. For example, this assumes .63 parking spaces per residential unit (based on the most current census data available for vehicle ownership per household in Downtown Seattle), but many developers may provide more parking than this. If it were to be assumed that developers provided one parking space per residential unit, the amount of parking provided would increase by about 2,800.

Table 4 estimates parking demand assuming moderate TDM, and more aggressive TDM. The 2020 demand estimate assuming moderate TDM is 23,837 spaces, while the estimate assuming more aggressive TDM is 19,598 spaces. This suggests that the demand for parking may exceed the minimum provided by 2,600 to 6,900 spaces. While this may at first seem significant, it is important to point out that the parking minimums indicated are just that —- minimums. Developers may provide more parking than the minimum required if market conditions warrant it. In addition, it is not unusual for parking to be severely restricted in downtown areas. The most typical result is an increase in parking prices.

Table 4 also presents off-street parking that would be displaced under the section "Parking Lost Due to Development." Future development under Alternative 4 would displace approximately 7,550 existing off-street parking spaces, of which approximately one-half would be from existing stand-alone public parking lots/garages and one-half would be from other land uses that have parking lots associated with them, but whose primary function is other than parking.[4] The new developments will provide some of their own parking, so the truly "displaced" parking might only be considered those developments that displace facilities that are currently stand-alone public parking garages or lots.

Most of the off-street parking displaced (from stand-alone public parking lots and garages) is concentrated into three areas Downtown, which are shown in Figure 2. These three areas represent about 79 percent of the 3,775 off-street parking spaces from garages/lots displaced by the new development. Area 1 is the north area of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way. Area two is just south of this area, bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue. Area three is a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets. As shown in Table 5, in Area 1 (between 9th Avenue and 6th Avenue, from Pine Street to Denny Way), about 1,900 parking spaces from lots and garages will be lost to development. This is an area where parking is currently more available and less expensive than in the heart of the business area of Downtown, which is located further south. In Area 2 (from Lenora Street to Stewart Street, between 5th Avenue and 1st Avenue), about 373 parking spaces from lots or garages will be lost to new development. In Area 3 (a one square block between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets), a 700 space parking garage will be displaced due to new development. This is in an area that is already expensive to park and few parking spaces available.

[4] Determination of current parking (whether parking is part of another land use or a stand-alone garage or lot) was determined by data received from the City of Seattle (20years_4.xls). It was assumed that parcels whose primary use are considered Public Parking Commercial Lot (Code 180) or Public Parking Garage (Code 182) are parking garages/lots. It was assumed that parcels whose primary land use was other than one of these two had parking included as part of the development, but the primary function wasn't parking.

The consequences of parking demand unmet by off-street parking supply would be increased demand for other off-street and on-street parking resources. It is likely there would be increased competition for on-street parking in a greater portion of the study area, and increased prices for off-street parking. This decrease in parking availability and increase in parking costs may impact businesses, primarily in the three areas indicated above. The degree to which these businesses could be impacted, however, cannot be fully addressed within the scope of this study.

The City could consider adjusting its parking minimums to increase the supply of parking that will be provided as redevelopment occurs. However, one important potential impact of a tighter parking supply is the increased use of alternative modes of transportation — which is consistent with the City's long-range goals. Therefore, the City may want to maintain the existing minimum parking standards in order to help encourage the use of alternative modes in the future.

Table 5
Off-Street Stand-Alone Parking Lost by Alternative
in Three Areas Most Affected

	Parking Spaces Lost from Stand-Alone Garages by Area		
	Area 1	**Area 2**	**Area 3**
Alternative 4 – Future No Build	1,900	373	700
Alternative 1	1,639	309	700
Alternative 2	1,639	309	700
Alternative 3	1,819	309	700

On-Street Parking

As noted above, increased overall parking demand from future development would likely lead to increased competition for on-street parking resources. This trend would be gradual and occur in response to the amount of additional development in a particular area. However, given that the largest concentration of future development would occur in the Denny Triangle neighborhood, the increased competition would most strongly occur in the Denny Triangle and nearby surrounding areas. More specifically, the areas that will most be impacted by increased competition for on-street parking are the same three areas presented in Figure 2: north of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way; the area bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue; and a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets.

In addition, as future development occurs, some displacement of on-street parking resources would likely occur due to the need for garage access points and possibly additional commercial vehicle parking spaces or other specialized types of parking or curb uses.

Figure 2
Three Areas Most Affected by Displacement of Parking Garages*

***Polygons indicate new development areas. Dots indicate displaced off-street parking lots/garages**

B. Alternative 1 – High End Height and Density Increase

While overall amounts of growth would be approximately the same under all alternatives, under Alternative 1 approximately 5 percent fewer existing off-street parking spaces would be displaced, and new development would likely affect a slightly lower number of blocks. This could mean less potential for disruption of existing on-street parking, and slightly less additional competition for on-street parking resources than under the No Action Alternative.

Off-Street Parking

Future residential and employment growth throughout the study area would increase overall demand for parking. Table 4 (page 8) compares predicted parking supply and demand

conditions in 2020 for all of the alternatives. A detailed description of Table 4 is provided at the beginning of the Impacts section of this memorandum. Demand is estimated for a baseline 2020 condition, as well as a TDM-intensive condition (to estimate how parking demand could be reduced if the new developments instituted strong TDM programs). Parking supply estimates in Table 4 assume that minimum parking requirements for commercial uses would be met, and that residential development (which has no minimum parking requirement) would provide .63 parking spaces per residential unit[5].

As shown in Table 4 under the section "Parking Spaces Added According to Current Code", the predicted amount of off-street parking supply provided with future development would be approximately 17,005 spaces. This includes about 12,357 office/retail parking spaces and about 4,648 residential spaces. Note that these estimates are conservative and developers may very well provide several thousand additional parking spaces. For example, this assumes .63 parking spaces per residential unit (based on the most current census data available for vehicle ownership per household in Downtown Seattle), but many developers may provide more parking than this. If it were to be assumed that developers provided one parking space per residential unit, the amount of parking provided would increase by about 2,800.

Table 4 estimates parking demand assuming moderate TDM, and more aggressive TDM. The 2020 demand estimate assuming moderate TDM is 23,762 spaces, while the estimate assuming more aggressive TDM is 19,505 spaces. This suggests that the demand for parking may exceed the minimum provided by 2,500 to 6,700 spaces. While this may at first seem significant, it is important to point out that the parking minimums indicated are just that —- minimums. Developers may provide more parking than the minimum required if market conditions warrant it. In addition, it is not unusual for parking to be severely restricted in downtown areas. The most typical result is an increase in parking prices.

[5] The value .63 is a low estimate based on 1990 census data for auto ownership per household in downtown Seattle census tracts. In reality, developers may instead provide each unit with a parking space. So this estimate of parking provided may be conservatively low.

Table 4 also presents off-street parking that would be displaced under the section "Parking Lost Due to Development." Future development under Alternative 1 would displace approximately 7,137 existing off-street parking spaces, of which approximately one-half would be from existing stand-alone public parking lots/garages and one-half would be from other land uses that have parking lots associated with them, but whose primary function is other than parking.[6] The new developments will provide some of their own parking, so the truly "displaced" parking might only be considered those developments that displace facilities that are currently stand-alone public parking garages or lots.

Most of the off-street parking displaced (from stand-alone public parking lots and garages) is concentrated into three areas Downtown, which are shown in Figure 2. These three areas represent about 76 percent of the 3,481 off-street parking spaces from garages/lots displaced by the new development. Area 1 is the north area of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way. Area two is just south of this area, bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue. Area three is a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets. As shown in Table 5, in Area 1 (between 9th Avenue and 6th Avenue, from Pine Street to Denny Way), about 1,639 parking spaces from lots and garages will be lost to development. This is an area where parking is currently more available and less expensive than in the heart of the business area of Downtown, which is located further south. In Area 2 (from Lenora Street to Stewart Street, between 5th Avenue and 1st Avenue), about 309 parking spaces from lots or garages will be lost to new development. In Area 3 (a one square block between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets), a 700 space parking garage will be displaced due to new development. This is in an area that is already expensive to park and few parking spaces available.

The consequences of parking demand unmet by off-street parking supply would be increased demand for other off-street and on-street parking resources. It is likely there would be increased competition for on-street parking in a greater portion of the study area, and increased prices for off-street parking. This decrease in parking availability and increase in parking costs may impact businesses, primarily in the three areas indicated above. The degree to which these businesses could be impacted, however, cannot be fully addressed within the scope of this study.

The City could consider adjusting its parking minimums to increase the supply of parking that will be provided as redevelopment occurs. However, one important potential impact of a tighter parking supply is the increased use of alternative modes of transportation — which is consistent with the City's long-range goals. Therefore, the City may want to maintain the existing minimum parking standards in order to help encourage the use of alternative modes in the future.

[6] Determination of current parking (whether parking is part of another land use or a stand-alone garage or lot) was determined by data received from the City of Seattle (20years_4.xls). It was assumed that parcels whose primary use are considered Public Parking Commercial Lot (Code 180) or Public Parking Garage (Code 182) are parking garages/lots. It was assumed that parcels whose primary land use was other than one of these two had parking included as part of the development, but the primary function wasn't parking.

On-Street Parking

Alternative 1's predicted on-street parking impacts in 2020 would be similar to but slightly less than impacts of the No Action Alternative. As noted above, increased overall parking demand from future development would likely lead to increased competition for on-street parking resources. This trend would be gradual and occur in response to the amount of additional development in a particular area. However, given that the largest concentration of future development would occur in the Denny Triangle neighborhood, the increased competition would most strongly occur in the Denny Triangle and nearby surrounding areas. More specifically, the areas that will most be impacted by increased competition for on-street parking are the same three areas presented in Figure 2: north of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way; the area bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue; and a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets.

In addition, as future development occurs, some displacement of on-street parking resources would likely occur due to the need for garage access points and possibly additional commercial vehicle parking spaces or other specialized types of parking or curb uses.

C. Alternative 2 – Concentrated Office Core

While overall amounts of growth would be approximately the same under all alternatives, under Alternative 2 approximately 5 percent fewer existing off-street parking spaces would be displaced, and new development would likely affect a slightly lower number of blocks. This could mean less potential for disruption of existing on-street parking, and slightly less additional competition for on-street parking resources than under the No Action Alternative.

Off-Street Parking

Future residential and employment growth throughout the study area would increase overall demand for parking. Table 4 compares predicted parking supply and demand conditions in 2020 for all of the alternatives. A detailed description of Table 4 is provided at the beginning of the Impacts section of this memorandum. Demand is estimated for a baseline 2020 condition, as well as a TDM-intensive condition (to estimate how parking demand could be reduced if the new developments instituted strong TDM programs). Parking supply estimates in Table 4 assume that minimum parking requirements for commercial uses would be met, and that residential development (which has no minimum parking requirement) would provide .63 parking spaces per residential unit[7].

As shown in Table 4 under the section "Parking Spaces Added According to Current Code", the predicted amount of off-street parking supply provided with future development would be approximately 16,989 spaces. This includes about 12,178 office/retail parking spaces and about 4,811 residential spaces. Note that these estimates are conservative and developers may very well provide several thousand additional parking spaces. For example, this assumes .63 parking spaces per residential unit (based on the most current census data available for vehicle ownership per household in Downtown Seattle), but many developers may provide more

[7] The value .63 is a low estimate based on 1990 census data for auto ownership per household in downtown Seattle census tracts. In reality, developers may instead provide each unit with a parking space. So this estimate of parking provided may be conservatively low.

parking than this. If it were to be assumed that developers provided one parking space per residential unit, the amount of parking provided would increase by about 2,800.

Table 4 estimates parking demand assuming moderate TDM, and more aggressive TDM. The 2020 demand estimate assuming moderate TDM is 23,752 spaces, while the estimate assuming more aggressive TDM is 19,534 spaces. This suggests that the demand for parking may exceed the minimum provided by 2,500 to 6,700 spaces. While this may at first seem significant, it is important to point out that the parking minimums indicated are just that —- minimums. Developers may provide more parking than the minimum required if market conditions warrant it. In addition, it is not unusual for parking to be severely restricted in downtown areas. The most typical result is an increase in parking prices.

Table 4 also presents off-street parking that would be displaced under the section "Parking Lost Due to Development." Future development under Alternative 2 would displace approximately 7,137 existing off-street parking spaces, of which approximately one-half would be from existing stand-alone public parking lots/garages and one-half would be from other land uses that have parking lots associated with them, but whose primary function is other than parking.[8] The new developments will provide some of their own parking, so the truly "displaced" parking might only be considered those developments that displace facilities that are currently stand-alone public parking garages or lots.

Most of the off-street parking displaced (from stand-alone public parking lots and garages) is concentrated into three areas Downtown, which are shown in Figure 2. These three areas represent about 76 percent of the 3,481 off-street parking spaces from garages/lots displaced by the new development. Area 1 is the north area of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way. Area two is just south of this area, bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue. Area three is a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets. As shown in Table 5, in Area 1 (between 9th Avenue and 6th Avenue, from Pine Street to Denny Way), about 1,639 parking spaces from lots and garages will be lost to development. This is an area where parking is currently more available and less expensive than in the heart of the business area of Downtown, which is located further south. In Area 2 (from Lenora Street to Stewart Street, between 5th Avenue and 1st Avenue), about 309 parking spaces from lots or garages will be lost to new development. In Area 3 (a one square block between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets), a 700 space parking garage will be displaced due to new development. This is in an area that is already expensive to park and few parking spaces available.

The consequences of parking demand unmet by off-street parking supply would be increased demand for other off-street and on-street parking resources. It is likely there would be increased competition for on-street parking in a greater portion of the study area, and increased prices for off-street parking. This decrease in parking availability and increase in parking costs may impact businesses, primarily in the three areas indicated above. The degree to which

[8] Determination of current parking (whether parking is part of another land use or a stand-alone garage or lot) was determined by data received from the City of Seattle (20years_4.xls). It was assumed that parcels whose primary use are considered Public Parking Commercial Lot (Code 180) or Public Parking Garage (Code 182) are parking garages/lots. It was assumed that parcels whose primary land use was other than one of these two had parking included as part of the development, but the primary function wasn't parking.

these businesses could be impacted, however, cannot be fully addressed within the scope of this study.

The City could consider adjusting its parking minimums to increase the supply of parking that will be provided as redevelopment occurs. However, one important potential impact of a tighter parking supply is the increased use of alternative modes of transportation — which is consistent with the City's long-range goals. Therefore, the City may want to maintain the existing minimum parking standards in order to help encourage the use of alternative modes in the future.

On-Street Parking

Alternative 2's predicted on-street parking impacts in 2020 would be similar to but slightly less than impacts of the No Action Alternative. As noted above, increased overall parking demand from future development would likely lead to increased competition for on-street parking resources. This trend would be gradual and occur in response to the amount of additional development in a particular area. However, given that the largest concentration of future development would occur in the Denny Triangle neighborhood, the increased competition would most strongly occur in the Denny Triangle and nearby surrounding areas. More specifically, the areas that will most be impacted by increased competition for on-street parking are the same three areas presented in Figure 2: north of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way; the area bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue; and a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets.

In addition, as future development occurs, some displacement of on-street parking resources would likely occur due to the need for garage access points and possibly additional commercial vehicle parking spaces or other specialized types of parking or curb uses.

D. Alternative 3 – Residential Emphasis

Alternative 3's predicted parking impacts in 2020 would be similar to but slightly less than impacts of the No Action Alternative. While overall amounts of growth would be approximately the same under all alternatives, approximately 3 percent fewer existing off-street parking spaces would be displaced, and new development would likely affect a slightly lower number of blocks. This could mean less potential for disruption of existing on-street parking, and slightly less additional competition for on-street parking resources than under the No Action Alternative.

Off-Street Parking

Future residential and employment growth throughout the study area would increase overall demand for parking. Table 4 compares predicted parking supply and demand conditions in 2020 for all of the alternatives. A detailed description of Table 4 is provided at the beginning of the Impacts section of this memorandum. Demand is estimated for a baseline 2020 condition, as well as a TDM-intensive condition (to estimate how parking demand could be reduced if the new developments instituted strong TDM programs). Parking supply estimates in Table 4 assume that minimum parking requirements for commercial uses would be met, and that

residential development (which has no minimum parking requirement) would provide .63 parking spaces per residential unit[9].

As shown in Table 4 under the section "Parking Spaces Added According to Current Code", the predicted amount of off-street parking supply provided with future development would be approximately 16,897 spaces. This includes about 12,201 office/retail parking spaces and about 4,696 residential spaces. Note that these estimates are conservative and developers may very well provide several thousand additional parking spaces. For example, this assumes .63 parking spaces per residential unit (based on the most current census data available for vehicle ownership per household in Downtown Seattle), but many developers may provide more parking than this. If it were to be assumed that developers provided one parking space per residential unit, the amount of parking provided would increase by about 2,800.

Table 4 estimates parking demand assuming moderate TDM, and more aggressive TDM. The 2020 demand estimate assuming moderate TDM is 23,678 spaces, while the estimate assuming more aggressive TDM is 19,451 spaces. This suggests that the demand for parking may exceed the minimum provided by 2,500 to 6,800 spaces. While this may at first seem significant, it is important to point out that the parking minimums indicated are just that —- minimums. Developers may provide more parking than the minimum required if market conditions warrant it. In addition, it is not unusual for parking to be severely restricted in downtown areas. The most typical result is an increase in parking prices.

Table 4 also presents off-street parking that would be displaced under the section "Parking Lost Due to Development." Future development under Alternative 3 would displace approximately 7,317 existing off-street parking spaces, of which approximately one-half would be from existing stand-alone public parking lots/garages and one-half would be from other land uses that have parking lots associated with them, but whose primary function is other than parking.[10] The new developments will provide some of their own parking, so the truly "displaced" parking might only be considered those developments that displace facilities that are currently stand-alone public parking garages or lots.

Most of the off-street parking displaced (from stand-alone public parking lots and garages) is concentrated into three areas Downtown, which are shown in Figure 2. These three areas represent about 77 percent of the 3,661 off-street parking spaces from garages/lots displaced by the new development. Area 1 is the north area of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way. Area two is just south of this area, bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue. Area three is a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets. As shown in Table 5, in Area 1 (between 9th Avenue and 6th Avenue, from Pine Street to Denny Way), about 1,819 parking spaces from lots and garages will be lost to development. This is an area where parking is currently more available and less expensive than in the heart of the business area of Downtown,

[9] The value .63 is a low estimate based on 1990 census data for auto ownership per household in downtown Seattle census tracts. In reality, developers may instead provide each unit with a parking space. So this estimate of parking provided may be conservatively low.

[10] Determination of current parking (whether parking is part of another land use or a stand-alone garage or lot) was determined by data received from the City of Seattle (20years_4.xls). It was assumed that parcels whose primary use are considered Public Parking Commercial Lot (Code 180) or Public Parking Garage (Code 182) are parking garages/lots. It was assumed that parcels whose primary land use was other than one of these two had parking included as part of the development, but the primary function wasn't parking.

which is located further south. In Area 2 (from Lenora Street to Stewart Street, between 5th Avenue and 1st Avenue), about 309 parking spaces from lots or garages will be lost to new development. In Area 3 (a one square block between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets), a 700 space parking garage will be displaced due to new development. This is in an area that is already expensive to park and few parking spaces available.

The consequences of parking demand unmet by off-street parking supply would be increased demand for other off-street and on-street parking resources. It is likely there would be increased competition for on-street parking in a greater portion of the study area, and increased prices for off-street parking. This decrease in parking availability and increase in parking costs may impact businesses, primarily in the three areas indicated above. The degree to which these businesses could be impacted, however, cannot be fully addressed within the scope of this study.

The City could consider adjusting its parking minimums to increase the supply of parking that will be provided as redevelopment occurs. However, one important potential impact of a tighter parking supply is the increased use of alternative modes of transportation — which is consistent with the City's long-range goals. Therefore, the City may want to maintain the existing minimum parking standards in order to help encourage the use of alternative modes in the future.

On-Street Parking

Alternative 3's predicted on-street parking impacts in 2020 would be similar to but slightly less than impacts of the No Action Alternative. As noted above, increased overall parking demand from future development would likely lead to increased competition for on-street parking resources. This trend would be gradual and occur in response to the amount of additional development in a particular area. However, given that the largest concentration of future development would occur in the Denny Triangle neighborhood, the increased competition would most strongly occur in the Denny Triangle and nearby surrounding areas. More specifically, the areas that will most be impacted by increased competition for on-street parking are the same three areas presented in Figure 2: north of Downtown bordered by 9th Ave., 6th Ave., Pine Street, and Denny Way; the area bordered by Lenora Street, Stewart Street, 5th Avenue and 1st Avenue; and a one-block area between 4th Ave. and 5th Avenue, bordered by Seneca and Spring Streets.

In addition, as future development occurs, some displacement of on-street parking resources would likely occur due to the need for garage access points and possibly additional commercial vehicle parking spaces or other specialized types of parking or curb uses.

III. MITIGATION STRATEGIES

Mitigation strategies for all alternatives would be similar, and would include strong TDM programs at the new development sites. These TDM programs could include considerable transit fare subsidies, such as included in the Flex Pass Program. Potential impacts of the mitigation strategies are presented in Table 4 in the section titled "2020 Potential Mitigation Impacts of TDM Supportive Measures." For this analysis, mode share from two data sources was compared: data from the *WSDOT CTR Task Force 2001 Report to the Legislature* for Downtown Seattle (for employers impacted by CTR legislation), and King County mode share information for a sample of Flex Pass Customers. The WSDOT CTR Task Force data is presumed to represent mode share for a "standard" TDM program, while the King County data is assumed to represent mode share for a more extensive TDM program. For all Downtown CTR-affected employers, vehicle trips per 100 employees were approximately 33, while for Flex Pass customers it was approximately 26. This difference was then applied to the Regional Model mode share in 2020 for all Downtown employees of 31 vehicle trips per 100 employees to estimate impacts of TDM mitigation. This method indicated 24 vehicle trips per 100 employees. As shown in Table 4, TDM mitigation can reduce demand for parking by about 22 percent.

Mitigating parking impacts is complicated, and the parking demand estimated using the assumptions described above does not fully mitigate parking impacts for any of the alternatives. However, market influences may help to balance the demand for parking with supply. As the parking supply becomes tighter, parking prices may increase. This in turn may lead to an increase in the supply of parking, as providing parking becomes more profitable.

Table 6
Mode Share Used to Estimate Mitigation Impacts

	2001	2000/2001
	All Downtown CTR Employers*	**TDM Aggressive (Flex Pass) Customers****
Bus	51%	59%
Drive Alone	26%	21%
Carpool/Vanpool	15%	10%
Non-Motorized	8%	9%
Veh. Trips Per 100 Employees***	33	26

**Source: WSDOT CTR Task Force 2001 Report to the Legislature, P. 7.*

***Source: King County, Handout from Oct. 18, 2001 Parking/TDM at Convention Place Meeting.*

**** Assumes 2.1 Vehicle Occupancy in Carpools/Vanpools*

APPENDIX

Mode Share Assumption Used to Predict Vehicle Trips Per Employee

Daily Person/Transit Trips to/from Work from Regional Model - Seattle CBD		
	Daily Person Trips to /from work **1998**	Daily Person Trips to /from work **2020**
Daily Transit	96,002	176,906
SOV	106,087	80,148
HOV	12,038	32,902
Daily Total Persons	214,127	289,955
Auto vehicles per person	*0.52*	*0.31*

*Assumes 2.1 occupants per HOV in 1998, and 3.2 in 2020.